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A newly recorded species of the genus *Zeiraphera* Treitschke (Lepidoptera, Tortricidae) from Korea

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ABSTRACT

In this study, we report a species of the genus *Zeiraphera subcorticana* (Snellen, 1883) for the first time from Korea. Adult and male genitalia were dissected and examined with their photos. All available information for the species including distributional ranges and host plants were provided.

Introduction

The genus *Zeiraphera* was established by Treitschke in 1829 and now comprises 32 described species in the world. It belongs to tribe Eucosmini in the family Tortricidae, which is the second largest tribe of the subfamily Olethreutinae. The common name of the Tortricidae, so called as “leaf roller”, was derived from the peculiar shape of the larval shelter-building by folding or rolling leaves of food plants (Brown, 2005). The tribe has a wide host range, mainly on *Quercus* sp. (Fagaceae), *Abies* sp. (Pinaceae), and various coniferous trees (Bradley et al., 1979; Ford, 1949; Issiki and Mutuura, 1961; Liu and Pai, 1977; Styles, 1959; Suzuki and Komai, 1984; Oku, 1961). Because of their wide host ranges, many species have been known as notorious pests to crops and trees. For example, the Spruce bud moth, *Zeiraphera ratzeburgiana* (Saxesen), is a harmful pest to coniferous trees in Europe to East Russia. They penetrate into the buds, feed on the needles, and move onto the growing point during the larval stage (Carroll et al., 1993).

In Korea, the first record of the genus *Zeiraphera* was *Z. griseana* (Hübner), which was listed in “List of Forest Insect Pests in Korea” (Ko 1969). Later Park (1983) listed one species for the genus, citing the previous report. Park and Ahn (1987) added a newly recorded species *Z. fulvomixtana* Kawabe. Byun and Park (1992) newly reported one species, *Z. virinea* Falkovitsh to Korea. Byun et al. (1996) reported two newly recorded species, *Z. demutana* (Walsingham) and *Z. rufimitrana* (Herrich-Schäffer). Also for the first time Byun (2011) reported a newly recorded species, *Z. lariciana* Kawabe from North Korea, based on the material of the Hungarian Natural History Museum, Budapest, Hungary. Consequently six species have been known from Korea to date. In this study, we found a species of the genus for the first time from Korea, during the course of an insect survey in Inje County, Province Gangweon-do, in the middle-eastern part of Korea. The aim of this study is to report a newly reported species for updating the faunistic knowledge of the microlepidoptera for the Korean peninsula.

Materials and methods

Material examined for this study was collected from Inje County, Korea and is now deposited at the Systematic Entomology Laboratory, Hannam University (SELHNU). Male genitalia were dissected and placed on a slide glass with Euparal mountant. The photographs for the species were taken by a digital camera, Pax cam (PAXcam Microscope Cameras Co., Chicago, IL, USA) attached on the microscope, Carl Zeiss Axio Imager A1 (Carl Zeiss Ltd., Cambridge, UK).

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Figures 1–2. Adult and male genitalia of *Zeiraphera subcorticana* (Snellen, 1883). 1, adult; 2, male genitalia. (scale bar: 1mm).

Systematic accounts

Order Lepidoptera Linnaeus, 1758
Family Tortricidae Latreille, 1803
Subfamily Olethreutinae Walsingham, 1895

Genus *Zeiraphera* Treitschke, 1829
Type species: *Tortrix corticana* (Denis and Schiffermüller, 1775)
= *Sinusia* Caradja, 1916
= *Charlotta* Forbes, 1923

Zeiraphera subcorticana (Snellen, 1883) 당단풍애기잎말이나방 (신칭)
(Figures 1–2)
Grapholitha Paedisca subcorticana Snellen, 1883: 215. Type locality (TL): Russia (Far East, Khabarovsk, Suifun River).
Aspis argutana Christoph, 1881: 79. TL: Russia (Far East, Primorsky Krai, Vladivostok).
Steganoptycha imprimata Caradja, 1916: 60. TL: Russia.
Steganoptycha imprimata var. *lavata* Caradja, 1916: 61. TL: Russia (Priamur'e).

Adult (Figure 1). Wingspan 11 mm in males. Head dark brown, antenna blackish brown. Thorax dark brown, mixed with grayish brown scales. Forewing with costa gently arched to the apex, the apex not acute, angulated to the termen, with six shortly paired costal streaks from 1/3 to apex. Ground color of forewing dark gray tinged with pale greenish gray; a basal patch broad, brownish green; a sub-triangular, whitish patch developed on the near middle of the dorsum. Hindwing with light grayish brown; outer margin slightly deep brown.

Male genitalia (Figure 2). Tegumen moderate. Uncus very short, triangular in outline, blunt terminally. Socii tongue shape with numerous long hairs, rounded terminally. Transtillae weak, membranous. Valva golf club shaped bearing numerous long and strong hairs along the ventral margin of the cucullus, basal opening ovate, slightly narrowed at 1/3 ventrally, rather broadened downwardly near middle of the ventral margin, then slightly narrowed near the apex; sacculus narrow with a bundle of short hairs on basal margin; Aedeagus stout, narrowed towards apex, with a bundle of cornuti in the vesica.

Female genitalia. Unknown.

Material examined. 1 ♂, Mt Eungbong, Inje, Province Gangweondo, Korea, 24 VII 2013 (leg. B.K.Byun), Genitalia slide number-4057 –coll. SELHNU.

Distribution. Korea (new record), China, Japan, Russia (Siberia).

Host plant. *Acer pseudosieboldianum* (Pax) Kom. (Aceraceae), *Acer palmatum* Thunb. (Aceraceae), and *Acer pictum* subsp. *mono* (Maxim.) Ohashi. (Aceraceae) (Nasu, 2013).

Remarks. This species is similar to *Z. fulvomixtana* especially in the male genitalia. However, it can be distinguished by a sub-triangular central spot of forewing instead of unapparent spot in the latter and rather broadened ventral area of valva and tongue-shaped socii in male genitalia.

Conflicts of interest

All authors declare no conflicts of interest.

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